

REMARKS

Claims 1-8, 19, 20, 31, 34 and 37-41 are pending in the present application. Claims 9-18, 21-30, 32, 33, 35 and 36 have been canceled by a previous amendment. Claims 1, 19, 20, 39 and 41 are independent. Reconsideration of this application, in view of the following remarks, is respectfully requested.

Examiner Interview

An interview was conducted with the Examiner in charge of the above-identified application on January 6, 2005. Applicants greatly appreciate the courtesy shown by the Examiner during the interview.

In the interview with the Examiner, the Examiner's rejection under 35 U.S.C. § 103(a) in view of the Huang et al., Marumoto et al. and Ciardella et al. references was discussed. Specifically, it was explained to the Examiner that the Marumoto et al. reference does not disclose a device that corrects mis-applied applications from a defective nozzle. As described at column 3, lines 10-16 of Marumoto et al., this reference discloses that defective nozzles are shut off and extra ink is applied to adjacent nozzles to make up for the lack of ink from the defective nozzles.

The Examiner indicated that it appeared that the Marumoto et al. reference did not disclose correcting mis-applied applications; however, the Examiner would have to further consider the Marumoto et al. reference in detail once a response was filed. It is requested that the Examiner further consider the Marumoto et al. reference in view of the following remarks.

Rejections Under 35 U.S.C. §103

Claims 1-5, 7, 8, 19, 20, 31, 34 and 37-41 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Huang et al., U.S. Patent No. 6,100,787 in view of Marumoto et al., U.S. Patent No. 6,692,095 and Ciardella et al., U.S. Patent No. 5,711,989. Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Huang et al. in view of Marumoto et al. and Ciardella et al., as applied to claims 2 or 3 above, and further in view of Itsuji, U.S. Patent No. 5,151,299. These rejections are respectfully traversed.

The present invention is directed to a method of applying viscous medium onto a substrate. Independent claim 1 recites a combination of steps including “add-on jetting of predetermined additional amounts of viscous medium on predetermined positions on the screen printed substrate, said add-on jetting being performed without masking or stenciling.” Independent claims 19, 20, 39 and 41 of the present invention are also directed to a method of applying viscous medium on a substrate. Independent claims 19 and 20 recite the step of “jetting additional viscous medium onto the substrate, said add-on jetting being performed without masking or stenciling.” Independent claim 39 of the present invention recites the step of “add-on jetting of individual droplets of viscous medium one drop at a time on predetermined positions on the screen printed substrate.” Independent claim 41 recites the step of “add-on jetting of solder paste on predetermined positions on the screen printed substrate.” Applicants respectfully submit that the references relied on by the Examiner fail to teach or suggest the presently claimed invention.

With regard to the Huang et al. reference relied on by the Examiner, this reference is directed to a multilayer ceramic package with low-variance embedded resistors. Referring to column 1, lines

11-31 of Huang et al., as mentioned by the Examiner, this reference does disclose that screen printing resistive paste can result in uneven applications of the resistive paste. However, the Examiner also states that Huang et al. “fails to explicitly teach smoothing these coatings” (emphasis added). Applicants submit that there is absolutely no suggestion in the Huang et al. reference, either explicitly or implicitly, that the uneven application of the resistive paste be corrected by “smoothing” the resistive paste as appears to be the position of the Examiner. In Huang et al., the problem of uneven application is not addressed by smoothing the resistive paste, but by completely re-designing the multilayer ceramic package. Specifically, in Huang et al., the problem of uneven application of the resistive paste is addressed by forming troughs 220 in the sheets 206 and 210 that are filled with the resistive paste during the screen printing process (see column 3, lines 14-16 of Huang et al.). Since the inclusion of the troughs results in a thicker layer of resistive paste, the variation in the application of the resistive paste has less of an effect on the resistance of the embedded resistor. In view of this, Huang et al. solves the problem of uneven application of the resistive paste by making the thickness greater, not by eliminating or smoothing out the unevenness.

The Examiner relies on the Marumoto et al. reference in order to modify Huang et al. to smooth the coatings. However, as mentioned above, Applicants submit that Huang et al. fails to recognize smoothing the resistive paste to correct the problem of uneven coatings. In other words, Huang et al. recognizes the problem, but there is no suggestion that that the solution to this problem would be to smooth the resistive paste, and more importantly, to smooth the resistive paste through add-on jetting of additional viscous medium as in the presently claimed invention. In addition, the

Marumoto et al. reference fails to suggest smoothing resistive paste and therefore fails to make up for the deficiencies of Huang et al.

In the Examiner's Office Action, the Examiner states "Marumoto teaches that jetting processes have the ability to correct uneven coatings (column 3, lines 1-50)." Applicants submit that Marumoto et al. does not, in fact, disclose correcting uneven coatings or mis-applied deposits. Referring to the Marumoto et al. reference, this reference discloses a color filter manufacturing method mainly for liquid crystal displays. The invention of Marumoto et al. addresses the general problem of efficiently using an ink-jet head having a multiple of ink discharging nozzles. More specifically, in devices prior to Marumoto et al., when one of the nozzles is defective, a set of nozzles including that defective nozzle can not be used. Hence, the overall time during which the ink-jet head is usable shortens from the defectiveness of one or more nozzles, and the ink-jet head must be frequently exchanged (See column 2, lines 45-59). The solution, according to Marumoto et al., is to stop discharging of ink from the defective nozzles, and compensating for the lack of ink from the defective nozzles by other nozzles in the set of nozzles (See Column 3, lines 11-16). There is no indication in Marumoto et al. of smoothing or correcting previously applied applications of ink. Marumoto et al. only discloses even application of ink.

The Examiner has taken the position that Marumoto et al. makes up for the deficiencies of Huang et al. and Ciardella et al. by teaching that jetting may be used to correct uneven coatings. As mentioned above, Marumoto et al. does not address the problem of smoothing uneven coatings. It is stated in Marumoto et al. that poor resolution and poor evenness is a drawback of the discussed print method. It is also stated that, in order to eliminate these drawbacks, methods of manufacturing color

filters by using an ink-jet system are known. It is not suggested in Marumoto et al. that an ink-jet system could be used for improving the evenness of an already printed substrate.

In addition, there is no mentioning whatsoever of screen printing in Marumoto et al. and therefore, one having ordinary skill in the art of screen printing would not look to Marumoto et al. for the solution to any problem experienced in screen printing. In other words, Marumoto et al. is directed to non-analogous prior art.

Furthermore, it should be noted that the Examiner cites three documents, one showing screen printing, one showing a method for ink-jetting, and one showing a method of jetting viscous medium. There is no link between these documents, neither regarding fields of technology, nor the problems that are solved and their solutions. In view of this, the Examiner has failed to establish a *prima facie* case of obviousness.

In view of the above, Applicants submit that the Examiner's rejection in view of the Huang et al, Marumoto et al. and Ciardella et al. references is improper and should be withdrawn.

With specific regard to independent claims 39 and 41 of the present invention, these claims recite add-on jetting of individual droplets of viscous medium one drop at a time and add-on jetting of solder paste on a previously screen printed substrate. Since the Huang et al., Marumoto et al. and Ciardella et al. references fail to disclose add-on jetting, Applicants submit that claims 39 and 41 are allowable for the same reasons mentioned above.

With regard to dependent claims 2-8, 31, 34, 37, 38 and 40, Applicants respectfully submit that these claims are allowable due to their respective dependence upon allowable independent claims 1 and 39, as well as due to the additional recitations in these claims.

With regard to the Examiner's reliance on the Itsuji reference, this reference fails to disclose add-on jetting being performed without masking or stenciling as recited in independent claims 1, 19 and 20 of the present invention and fails to disclose add-on jetting of individual droplets of viscous medium or add-on jetting of solder paste as respectively recited in independent claims 39 and 41 of the present invention. Accordingly, this reference fails to make up for the deficiencies of Huang et al., Marumoto et al. and Ciardella et al.

In view of the above amendments and remarks, Applicants respectfully submit that claims 1-8, 19, 20, 31, 34 and 37-41 clearly define the present invention over the references relied on by the Examiner. Accordingly, reconsideration and withdrawal of the Examiner's rejections under 35 U.S.C. § 103 are respectfully requested.

CONCLUSION

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently pending rejections and that they be withdrawn.

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

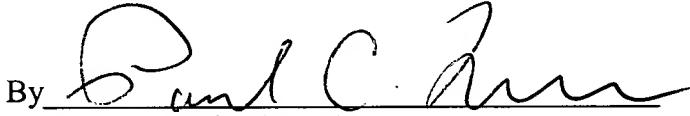
In the event there are any matters remaining in this application, the Examiner is invited to contact Paul C. Lewis, Registration No. 43,368 at (703) 205-8000 in the Washington, D.C. area.

Docket No. 0104-0354P
Appl. No. 09/901,592
Reply dated January 26, 2005
Reply to Office Action of November 23, 2004
Page 8 of 8

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By 
Paul C. Lewis, #43,368

PCL
0104-0354P
P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000